

## ABSTRACT

Methods and apparatuses for detecting low levels of a substance of interest in a sample using photoacoustic spectroscopy are provided. This method comprises exciting the sample with light having a wavelength that is absorbed by the substance of interest; generating an acoustic wave within the sample; detecting the acoustic wave; and determining the amount of the substance of interest present in the sample. The method can be used to detect the amount of water in an oil sample at detection limits lower than currently available.